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AMSAT NEWS SERVICE
ANS-153

The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on http://www.amsat.org publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to:
ans-editor at amsat.org.

You can sign up for free e-mail delivery of the AMSAT News Service Bulletins via the ANS List; to join this list see:
http://www.amsat.org/mailman/listinfo/ans

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SB SAT @ AMSAT $ANS-153.01
ANS-153 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 153.01
 From AMSAT HQ KENSINGTON, MD.
DATE June 2, 2019
To All RADIO AMATEURS
BID: $ANS-153.01

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Here is an excellent opportunity to get the most from your donations to the ARISS FundRazr. The FundRazr Project was initiated to raise $150,000 towards the ARISS Radio Upgrade on ISS. To date 90 contributors have donated $24,840 to the campaign, about 17% of the goal. $10,000 of your dollars, donated now, will raise that total to $44,840, including the matching funds. It would be great if we could actually achieve one-third of our goal ($50,000) by mid-June. Please donate today at https://fundrazr.com/arissnextgen?ref=ab_6ruVeeeNzOa6ruVeeeNzOa

[ANS thanks AMSAT for the above information]

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Satellite Corporation (AMSAT) promotes our own version of Field Day focused on operation via the amateur satellites, held concurrently with the ARRL event.

The AMSAT Field Day 2019 event is open to all Amateur Radio operators. Amateurs are to use the exchange as specified in ARRL rules for Field Day. The AMSAT competition is to encourage the use of all amateur satellites, both analog and digital.

The congestion on FM LEO satellites is always so intense that we must continue to limit their use to one-QSO-per-FM-satellite. This includes the International Space Station. You will be allowed one QSO if the ISS is operating Voice.

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After a few days of health and status checks, LightSail 2's four dual-sided solar panels will swing open. Roughly a day later, four metallic booms will unfurl four triangular Mylar sails from storage. The sails, which have a combined area of 32 square meters [344 square feet], will turn towards the sun for half of each orbit, giving the spacecraft a tiny push no stronger than the weight of a paperclip. For about a month after sail deployment, this continual thrust should raise LightSail 2's orbit by a measurable amount.

LightSail 2 will fly in a 24-degree inclination, 720 km, circular orbit. At latitudes of 42 degrees north it will reach a maximum elevation of 10 degrees above the horizon.

Lightsail-2 has been issued an experimental radio license WM9XPA and transmit on 437.025 MHz. A morse beacon will transmit the callsign every 45 seconds. A packet beacon will transmit AX.25, FSK 9K6 bps data.
Beacon information is available at:
http://tinyurl.com/ANS-153-Lightsail-Morse-Beacon
Documentation of the downlink telemetry data structure is posted at:
http://tinyurl.com/ANS-153-Lightsail-Telemetry

[ANS thanks the Planetary Society for the above information]

AMSAT-EA FossaSat-1 Receives IARU Coordination

The IARU reported that AMSAT-EA FossaSat-1 satellite has received a downlink coordination to operate on 436.700 MHz with LoRa 125kHz, Chirp Spread Spectrum Modulation, 180 bps, 100mW; and, FSK RTTY 45 baud ITA2, 100mW 183hz Shift.

The planned mission objectives for the 5x5x5cm 250gram satellite are:

+ General development of miniaturized and inexpensive satellite systems for space applications using off the shelf components.

+ Testing a new solar panel mechanism, making this satellite the smallest to have deployable solar arrays. These solar arrays will additionally increase the radar reflectivity significantly to that of a standard cubesat.

+ The promotion & involvement of students in aerospace development on an international level, giving them the opportunity to test their hardware and software experiments on the satellite. AMSAT-EA will be hosting STEM workshops & competitions for secondary students to participate in, a full section of the satellite is dedicated to these experiments for educational research.

+ The main mission of the satellite is the testing of a new experimental RF chirp modulation called LoRa, this new modulation hugely increases the link budget, reduces the power consumed and reduces the cost of receivers.

Students & Amateurs will be able to receive telemetry from the satellite with inexpensive hardware, expanding & promoting the amateur satellite community among youth.

Uplink challenges will also be carried out with rewards for amateurs. AMSAT-EA will provide decoding software for SDR use in order to allow anyone to decode LoRa using common existing hardware & host software for users to submit telemetry data, making all data public and reward-

ing users with certificates & awards.

The IARU coordination announcement can be accessed at:
http://www.amsatuk.me.uk/iaru/finished_detail.php?serialnum=652

[ANS thanks AMSAT-EA and the IARU for the above information]

QO-100 meets HAM RADIO 2019 in Friedrichshafen

Peter Guelzow, DB2OS, President of AMSAT-DL invites everyone to meet members of the QARS, AMSAT-DL and also QO-100 users, face-to-face at the HAM RADIO 2019 exhibition from June 21-23 June in Friedrichshafen.

A special event station DL50AMSAT will be operating live from the AMSAT-DL booth, DATV (DVB-S2) transmissions are also planned.

There will be several lectures around Qatar-OSCAR 10 and you can meet the P4-A team at the QARS and AMSAT-DL stands, which are located next to each other.

We also welcome members of the BATC team at our booth.

For more information visit:
https://amsat-dl.org/en/ham-radio-2019-qo-100-meeting/

[ANS thanks Peter Guelzow, DB2OS, President of AMSAT-DL for the above information]

ARISS SSTV Planned Over Russia for Moscow Aviation Institute

A Russian MAI-SSTV event is planned for Wednesday, June 5 from 12:00-16:00 UTC and June 6 from 11:30-15:30 UTC. Transmissions are expected to be at 145.800 MHz in SSTV mode PD120. Based on the times received, SSTV signals are not expected over N. America.

This event uses a computer in the ISS Russian Segment, which stores images that are then transmitted to Earth using the ARISS Amateur Radio station located in the Service Module which employs the Kenwood TM-D710E transceiver.

Amateur radio operators and other radio enthusiasts are invited to post the images they receive at
http://www.spaceflightsoftware.com/ARISS_SSTV/index.php

Please note that the event is dependent on other activities, schedules and crew responsibilities on the ISS and is subject to change at any time.

Online WebSDR receivers can be used to receive signals from the International Space Station at SUWS WebSDR located Farnham near London http://farnham-sdr.com/ and R4UAB WebSDR located European Russia http://websdr.r4uab.ru/.

For updates check Twitter at
https://twitter.com/ARISS_status/status/1131945966297182210?s=03

[ANS thanks ARISS and AMSAT-UK for the above information.]

Upcoming Satellite Operations

See https://www.amsat.org/satellite-info/upcoming-satellite-operations/
for latest information.

Pre-Hot Rod Power Tour Rove (Wyoming to Tennessee) – June 2-7, 2019
On June 2nd, RJ, WY7AA and the Elco will head South to start roving on the DM77/78 gridline, heading east working gridlines and corners along the way all the way to EM87/88 hopefully. RJ will try to be on as many FM passes as possible, with a few linears as time allows. Follow RJ on APRS.fi as WY7AA-9, as he will not have Twtter access along the road. Checkout WY7AA's QRZ page for specific plans he will post before he leaves, and @dtabor (N6UA) will help by posting on Twitter if he has any updates from the road.

EM57/EM67 Line – June 4, 2019
Michael, N4DCW, will be at the EM57/67 line on June 4, 2019. He'll post satellite passes a week before on twitter and the -bb, but will plan for the AO-9x and SO-50 midday passes. FM only. The day of, Michael will post updates via his twitter feed: https://twitter.com/MWimages

Hot Rod Power Tour Rove (North Carolina to Ohio) – June 8-14, 2019
From June 8th to 14th, WY7AA will be traveling with several thousand other Hot Rods along a winding route from NC to OH. RJ will mostly be activating in the evenings on FM passes including grids EM95, FM06, EM86, EM78, EM69, EN71, and EN81. Checkout the event route: http://tinyurl.com/ANS-153-HotRods And if anyone is anywhere close to the route, come out and see the spectacle and let RJ know on Twitter if you are coming out. Follow RJ on APRS.fi as WY7AA-9.

#HomewardBoundRove (DN13, DN14, DN21, DN22, DN23) – June 14-18,2019
Casey, KI7UNJ, will be hitting a few grids on his way home. Look for DN13/DN14 line on June 14th, DN21/DN22 line June 15th, DN22 June 17, and DN23 June 18th. FM only. Pass times expected between 1700-2000UTC. Specific passes to be posted on Casey's Twitter feed: https://twitter.com/KI7UNJ

Post Hot Rod Power Tour Rove (New York to Wyoming) – June 15-27, 2019
Following the Hot Rod Power Tour, I will be heading to FN02 for a few days and plan to work FN01/11 gridline around June 17-18. Details to follow. I will be heading as far east as FN32 and then eventually working my way back to DN71. Specifically looking for EN01/02 along the way. Details will be posted to Twitter and my QRZ page as the trip plans unfold. Follow him on APRS.fi as WY7AA-9, as he will not have Twitter access along the road.

#JosephOrBustRove (DN04, DN05, DN15) – June 28-30, 2019
Casey, KI7UNJ, will be wandering around Eastern Oregon and decided to do a little grid activating. Look for Casey on FM passes in DN04 mid-Friday, June 28th, in DN15 Friday night to Saturday evening, and DN05 Sunday morning. Specific passes to be posted on Casey's Twitter feed https://twitter.com/KI7UNJ

Iceland (HP95 IP15 IP25 IP03 HP03) – July 13-19, 2019
Adam, K0FFY, is taking his family (and his radios) to Iceland. Tentative schedule is HP95 July 13, IP13 and IP15 July 14-15, IP25 July 16, IP03 or HP93 July 17-18, and HP94 July 19. There's a lot to see, so passes will be best effort and announced on Twitter shortly prior. https://twitter.com/K0FFY_Radio

Please submit any additions or corrections to ke4al (at) amsat.org

[ANS Thanks Robert Bankston, KE4AL, for the above information]

Send Your Name (and callsign) to Mars
NASA Press Release May 21, 2019

NASA is giving the public an opportunity to send their names – etched on microchips – to the Red Planet with NASA's Mars 2020 rover, which represents the initial leg of humanity’s first round trip to another planet. The rover is scheduled to launch as early as July 2020, with the spacecraft expected to touch down on Mars in February 2021.

The opportunity to send your name to Mars comes with a souvenir boarding pass and "frequent flyer" points. From now until Sept. 30, you can add your name to the list and obtain a souvenir boarding pass to Mars here: https://go.nasa.gov/Mars2020Pass

The Microdevices Laboratory at NASA's Jet Propulsion Laboratory (JPL) in Pasadena, California, will use an electron beam to etch the submitted names onto a silicon chip with lines of text smaller than one-thousandth the width of a human hair (75 nanometers). At that size, more than a million names can be inscribed on a single dime-size microchip. The chip (or chips) will ride on the rover under a glass cover.

For more information on Mars 2020, visit:
https://www.nasa.gov/mars2020
For more about NASA's Moon to Mars plans, visit:
https://www.nasa.gov/topics/moon-to-mars

[ANS thanks NASA for the above information]

RS-10 Downlink Provides Unique Troubleshooting Solution

Terry Osborne, ZL2BAC, recalls a troubleshooting solution utilizing the downlink from the RS-10 satellite as he was resolving an HF noise problem in the radio system of New Zealand's Maritime Radio Network. (http://tinyurl.com/ANS-153-NZ-Maritime-Radio)

The New Zealand network consists of a chain of VHF base stations, an HF Transmitter site and an HF Receiving site. These are all linked back to an Operations Centre in Lower Hutt (near Wellington).

During commissioning, Terry was visiting the Operations Centre where the operators mentioned that the HF receivers were very noisy. This didn't sound right since the receiving site had been chosen because it was in a remote area well away from any man made noise.

Terry said, "To check how well the receivers were working I gave the operators the frequency and a week of pass times for RS-10. This was on a Friday. On Saturday I turned on my receiver at home on RS-10. My receiver was a TenTec Argonaut 505 with DGFet preamp and a half wave dipole at about 10 feet. RS-10's downlink boomed in at about 5x7. The Maritime operators heard nothing on their receivers. I fed the audio down the phone line to convince them it was working."

The four HF receivers are fed from a Multicoupler that has a "Low Noise" amplifier feeding a splitter. On the following Monday, the technicians from the maintenance base visited the site and at AOS of RS-10, turned off the power supply to the multicoupler. The Operations Centre reported down went the HF noise and up came the signal from RS-10.

Terry reported on the solution, "There were many options for the 'Low Noise' amplifier in the multicoupler ranging from a 2dB noise figure 10 dB gain version up to a 30dB gain 15dB noise figure version. Upon removing the lid from the multicoupler it revealed that the 30dB gain 15dB noise figure version had been supplied rather than the 2dB noise figure 10dB gainversion specified. It turned out that the manufacturers of the Multicoupler hadn't actually made one with a 2dB NF/10dB Gain amp before and had just supplied their standard version. Putting in the right amplifier solved the problem."

In closing, Terry wrote, "Satellite operators who have worked with preamps will recognise this problem."

[ANS sends an 'Ahoy' with a tip of the sailing hat and thanks Terry Osborne, ZL2BAC for the above information]

Satellite Shorts From All Over

+ Virgin Orbit has posted updated information about the LauncherOne initial flight which is AMSAT's RadFxSat-2 (Fox-1E) ride to orbit: http://tinyurl.com/ANS-153-Fox1E-VirginOrbital
This cubesat will feature a V/u inverting analog SSB/CW transponder and a digital beacon:
Uplink: 145.890 - 145.860 MHz LSB
Downlink: 435.760 - 435.790 MHz USB
Beacon: 435.750 MHz 1200 baud BPSK

+ AMSAT is pleased to offer a set of Titleist Pro V1x golf balls. One bears the GOLF-TEE logo, one the GOLF-1 logo and one the AMSAT 50th Anniversary logo. There are also a set of the same 3 golf balls with the logos that have also been signed by 3 of the AMSAT presidents. Keith Baker, KB1SF, has signed the GOLF-TEE ball, Barry Baines, WD4ASW, has signed the GOLF-1 ball and Joe Spier, K6WAO, has signed the AMSAT 50th Anniversary ball. The set of 3 balls is $50 plus shipping. The set of 3 balls with the 3 AMSAT President signatures is $100 plus shipping. Take care of your Father's Day shopping on-line at:
https://www.amsat.org/product/2019-fundraising-golf-balls-set-of-3

+ The ARISS team has posted an album of photos in memory of Keith Pugh, W5IU - SK at http://tinyurl.com/ANS-153-ARISS-W5IU-Album (facebook). Keith was an active AMSAT and ARISS volunteer. He passed away on May 24. A memorial service for Keith Pugh, W5IU, will be held at 2 p.m. on Thursday, June 6, in the Sanctuary of First Presbyterian Church with a reception following. 1000 Penn St, Fort Worth, TX 76102.
https://fpcfw.org/su-event/431761720/memorial-service-keith-pugh/
Obituary for Keith:
https://www.swaimfuneralhome.com/obituary/keith-pugh

+ The Tico Times in Costa Rica featured an article about the ARISS contact with the Costa Rica Institute of Technology (TEC), Los Suenos, Costa Rica on May 27.
http://tinyurl.com/ANS-153-ARISS-CostaRica

+ AMSAT-DL AMSAT Deutschland released a video of theQatar-OSCAR 100 (P4-A/ Es'hail-2) launch with a SpaceX Falcon 9 launcher from Cape Canaveral Air Force Station Space Launch Complex 40 in Florida:
https://youtu.be/8uQqZBIUfHY

+ NASA TV will provide live coverage as a SpaceX Dragon cargo space-

craft is set to return to Earth from the International Space Station Monday, June 3. NASA Television and the agency's website will provide live coverage of the craft's release beginning at 11:45 a.m. EDT. (UTC - 4) Around noon, flight controllers at mission control in Houston will deliver remote commands to the station's Canadarm2 robotic arm to detached Dragon from the Earth-facing port of the Harmony module.
https://www.nasa.gov/multimedia/nasatv/index.html#public

+ The Science Museum's YouTube channel has a video of the first astronaut from the UK, Helen Sharman GB1MIR, who used amateur radio to talk to students in schools across the UK. In May 1991, Helen Sharman became the first Briton in space. The Soyuz TM-12 mission, which included Soviet cosmonauts Anatoly Artsebarsky, U7MIR and Sergei Krikalev U5MIR, launched on May 18, 1991 and lasted eight days, most of that time spent at the Mir space station. Watch the video at: https://youtu.be/x0-nMl0jf5E

+ The European Space Agency's Astro Pi Challenge which allows students to design an experiment, write the code, and then have it run by an astronaut aboard the International Space Station, enjoyed a student's success recently when one of the Astro Pi units running a Raspberry Pi 1 B+ and a Raspberry Pi Camera Module captured the approach of a Soyuz spacecraft arriving at the ISS. Check out the photos and learn more at:
https://www.raspberrypi.org/blog/raspberry-pi-captures-soyuz-in-space/

+ Sean Kutzko, KX9X, has written a contribution to DX Engineering's blog "On All Bands." In this article, he writes about the basics of VHF propagation, to help you stay active during the solar minimum: http://tinyurl.com/ANS-153-KX9X-VHF -and- a newly released blog entry covers the basics of satellite operation: http://tinyurl.com/ANS-153-KX9X-Satellite

+ Dhruv Rebba, KC9ZJX, Radio Club of America Young Achiever Award, Dave Kalter Youth DX Adventure participant, recipient of an AMSAT Presidential Award is interviewed in a webcast 'Sankalp' from NewView Studios: https://youtu.be/TUce-WyZPdc The Sankalp program showcases and inspires youth in the community.

+ The Cal Poly CubeSat Team is requesting input to fill out their survey where they are gathering information about the connectors, electrical interfaces, and communication protocols currently in use by CubeSat and payload developers. The feedback will be used to help design the XCube platform, which will create opportunities for CubeSats to fly on NASA's high altitude aircraft for testing and calibration purposes. Access the survey at: https://forms.gle/TKxTgcZKVmfNv8F17

+ Edmund Spicer, M0MNG, made a video about his visit to Hamvention 2019. The AMSAT satellite demonstration station operated by Paul, N8HM and Matt, NJ4Y is shown: https://youtu.be/nnbQbJnkxs0?t=861

+ The May 2019 issue of SatMagazine is available at: http://www.satmagazine.com/

+ The June 2019 issue of CQ-DATV magazine is available at: https://cq-datv.mobi/72.php

[ANS thanks everyone for the above information]

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In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits. Application forms are available from the AMSAT Office.

Primary and secondary school students are eligible for membership at one-half the standard yearly rate. Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status. Contact Martha at the AMSAT Office for additional student membership information.

73 and remember to behave and to help keep amateur radio in space,
This week's ANS Editor,
JoAnne Maenpaa, K9JKM
k9jkm at amsat dot org